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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/699,845

11/04/2003

Sung-Su Jung

8734.248.00 US

4037

30827

7590

11/12/2008

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EXAMINER

LIN, JAMES

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

11/12/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/699,845	Applicant(s) JUNG ET AL.	
	Examiner Jimmy Lin	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11-13 and 15-17 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8, 11-13 and 15-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 8-9, 11-13, and 15-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no support for "the second flow amount being divided into predetermined parts" and "wherein the dispensing material is still dispensed if the number of intermediate amounts of gas is less than the divided parts of the second flow amount of gas and the dispensing material is not dispensed if the number of intermediate amounts of gas is equal to the divided parts of the second flow amount of gas". The specification only teaches that dispensing can still be performed if a detected flow amount of gas is in the range between the first flow amount and a sum of the first and second flow amounts [0030], but does not teach how it relates to a divided parts of the second flow amount of gas. For the purpose of this examination, the claim will be interpreted to be at least inclusive of wherein the continuation of the dispensing is based on either the second flow amount of gas or the divided parts of the second flow amount of gas.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 8, 11-12, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. (U.S. Publication No. 2001/0013920) in view of Shimano (U.S. Patent No. 5,277,333).

Hashimoto teaches a method of making a liquid crystal display (LCD) (abstract). Liquid crystal can be injected onto a substrate using a syringe [0050]. An air pressure source 44 supplies air into the syringe and a controller 43 controls the air pressure source to regulate the volume of the liquid crystal composition to be discharged ([0109]; Fig. 14). Repeated dispensings would be performed when the syringe was dispensed onto subsequent substrates. The transition to the subsequent substrates would necessarily require intermediate flow amounts of gas.

Hashimoto does not explicitly teach detecting the intermediate amounts of gas corresponding to the dispensed amount of the dispensing material in the syringe. However, Hashimoto does teach that an air pressure source 44 supplies air into the syringe and a controller 43 controls the air pressure source to regulate the volume of the liquid crystal composition to be discharged ([0109]; Fig. 14). The gas flow is controlled in order to regulate the amount of liquid crystal dispensed. The measurement of a controlled flow would have been an obvious modification to one of ordinary skill because additional measurements would have provided further control and precision. Furthermore, the flow of gas can be calculated using the ideal gas law $PV = nRT$ (P is pressure, V is volume, n is the amount or mols of gas, R is a constant, T is temperature). The flow amount of gas (i.e., the variable n) can be calculated because pressure, volume, and temperature are known. It would have been obvious to one of ordinary skill in the art at the time of invention to have calculated the amount of gas in the dispensing of Hashimoto using known relationships, such as the ideal gas law.

Hashimoto does not explicitly teach determining a second flow amount of gas by supplying the gas to the syringe, wherein the second flow amount of gas is the amount of gas such that the syringe is filled with the minimum quantity of residual dispensing material that is enough to ensure a previous dispensing but not enough for a subsequent dispensing. However, Shimano recognizes the need to prevent further dispensing once a preset minimum value is reached in a syringe (col. 5, lines 38-40). An obvious preset minimum value would be a value that does not allow a sufficient amount for a subsequent dispensing because such a minimum

value would allow the most dispensings from a single syringe so that the number of refills required is reduced and because an insufficient dispensing would cause a defect. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have stopped the dispensing once a preset minimum amount of liquid crystal material is left in the syringe of Hashimoto with a reasonable expectation of success. One would have been motivated to do so in order to have increased the process efficiency by reducing the number of refills and to have prevented a defect in the LCD. The determination of the second flow amount of gas would have been available to one of ordinary skill knowing the correlation between the amount of gas used compared to the amount of liquid crystal dispensed, wherein the correlation can be calculated using the ideal gas law.

As to determining a residual number of dispensings remaining in the syringe by comparing the number of intermediate amounts of gas with the divided parts of the second flow amount of gas, such a determination merely requires basic arithmetic and, thus, would have been an obvious step.

As to wherein the dispensing material is still dispensed if the number of intermediate amounts of gas is less than the second flow amount of gas and the dispensing material is not dispensed if the number of intermediate amounts of gas is equal to the second flow amount of gas, such a modification is explained above regarding a preset minimum value in the syringe.

Hashimoto does not explicitly teach determining a first flow amount of gas by supplying a gas to a syringe filled with the dispensing material, wherein the first flow amount of gas is the amount of gas necessary for the syringe to be capable of dispensing in response to an additional amount of gas. However, a space in the piping between the syringe and the gas supply and a space above the dispensing material in the syringe will exist that need to be filled by the supply gas. Any amount of gas flowing into these spaces without a corresponding dispensing would cause inconsistencies and possible defects in the first LCD substrate because the amount of liquid crystal dispensed would be less than the desired amount. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have determined the first flow amount of gas in the dispensing method of Hashimoto with a reasonable expectation of success. One would have been motivated to do so in order to have performed consistent dispensings and to have prevented defects.

Claim 11: Hashimoto teaches that a sealant can be injected on the substrate through a nozzle or a dispenser method [0046], but does not explicitly teach that the dispenser method for the sealant can be performed using a syringe. However, Hashimoto does teach that dispensings onto a LCD substrate can be performed through a nozzle of a syringe 42 ([0050]; Fig. 14). A syringe is a type of dispenser method. Because Hashimoto requires the need for the sealant to be injected through a nozzle or a dispenser method and because Hashimoto also teaches that a syringe having a nozzle is an operable dispenser for depositing onto an LCD substrate, it would have been obvious to one of ordinary skill in the art at the time of invention to have dispensed the sealant of Hashimoto using a syringe with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Claim 12: Hashimoto teaches that the dispensing material is liquid crystal.

Claims 15-16: Hashimoto teaches that a sealant is formed on a first substrate [0046], a liquid crystal layer is formed between the first and a second substrate, and the first and second substrates are attached (Fig. 14).

5. Claims 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto '920 in view of Shimano '333 as applied to claim 8 above, and further in view of Lee et al. (U.S. Publication No. 2003/0020845) and Hashimoto et al. (U.S. Publication No. 2003/0083203).

Hashimoto '920 and Shimano are discussed above.

Hashimoto '920 does not teach that one of the substrates is a thin film transistor (TFT) substrate having a common voltage line and that the other substrate is a color filter substrate having a common electrode, and forming a silver dot on either substrate connecting the common voltage line and the common electrode. However, Lee teaches that it was well known to have used a color filter substrate and a TFT substrate in an LCD device. The color filter substrate has a common electrode and the TFT substrate has a common voltage line. An electrical connection can be formed between the common voltage line and the common electrode using silver dots 14 ([0009]-[0011]; Fig. 1). Because Lee teaches that the use of such LCD substrates and the use of

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such connections of the substrates were operable in the art, it would have been obvious to one of ordinary skill in the art at the time of invention to have used a TFT substrate having a common voltage line and a color filter substrate having a common electrode as the particular substrates of Hashimoto '920 and to have connected the common voltage line and the common electrode with a silver dot with a reasonable expectation of success.

Hashimoto '920 and Lee do not explicitly teach that the silver dot can be formed using a syringe. However, Hashimoto '203 teaches that conductive fine particles, such as silver can be dropped onto an LCD substrate from a nozzle [0102]-[0104] and Hashimoto '920 teaches that materials can be deposited onto an LCD substrate by dropping the material through a nozzle of a syringe. The deposition of a silver dot using the syringe of Hashimoto '920 would have been an obvious modification over the combination of Hashimoto '203 and Hashimoto '920. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have formed the silver dots of Lee using the syringe of Hashimoto '920 with a reasonable expectation of success.

6. Claims 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto '920 in view of Shimano '333 as applied to claim 8 above, and further in view of Song et al. (U.S. Publication No. 2002/0008794) and Hashimoto '203.

Hashimoto '920 and Shimano are discussed above.

Hashimoto '920 does not teach that one of the substrates is a thin film transistor (TFT) substrate having a common voltage line and that the other substrate is a color filter substrate having a common electrode, and forming a silver dot on either substrate connecting the common voltage line and the common electrode. However, Song teaches that it was well known to have used a color filter substrate and a TFT substrate in an LCD device. The color filter substrate has a common electrode and the TFT substrate has a common voltage line [0006]. An electrical connection can be formed between the common voltage line and the common electrode using silver dots 163 ([0014],[0039]; Fig. 6). Because Song teaches that the use of such LCD substrates and the use of such connections of the substrates were operable in the art, it would have been obvious to one of ordinary skill in the art at the time of invention to have used a TFT substrate having a common voltage line and a color filter substrate having a common electrode

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as the particular substrates of Hashimoto '920 and to have connected the common voltage line and the common electrode with a silver dot with a reasonable expectation of success.

Hashimoto '920 and Song do not explicitly teach that the silver dot can be formed using a syringe. However, such a modification is obvious over Hashimoto '203, as discussed immediately above.

Response to Arguments

7. Applicant's arguments filed 8/17/2007 have been fully considered but they are not persuasive.

Applicant argues on pg. 6 that none of the cited references recites the combination of elements including "determining a residual number of dispensings remaining in the syringe". However, the number of residual dispensings can be calculated using known relationships and basic arithmetic. See rejection above regarding detecting the intermediate flow amount of gas and determining the second flow amount of gas.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is (571)272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jimmy Lin/
Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit
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